

# Class V Injection Well Subclasses

Table 2

Name of Well Type and Description	Ground Water Contamination Potential	Potential Contaminants	EPA Well Code
<b>DRAINAGE WELLS (a.k.a. DRY WELLS)</b>			
<b>Agricultural Drainage Wells</b> — receive irrigation tailwaters, other field drainage, animal yard, feedlot, or dairy runoff, etc.	High	Pesticides, nutrients, pathogens, metals transported by sediments, salts.	5F1
<b>Storm Water Drainage Wells</b> — receive storm water runoff from paved areas, including parking lots, streets, residential subdivisions, building roofs, highways, etc.	Moderate	Heavy metals (Cu, Pb, Zn) organics, high levels of coliform bacteria. Contaminants from streets, roofs, landscaped areas, Herbicides, Pesticides.	5D2
<b>Improved Sinkholes</b> — receive storm water runoff from developments located in karst topographic areas.	High-Moderate	Variable: pesticides, nutrients, coliform bacteria.	5D3
<b>Industrial Drainage Wells</b> — wells located in industrial areas which primarily receive storm water runoff but are susceptible to spills, leaks, or other chemical discharge.	High-Moderate	Usually organic solvents, acids, pesticides, and various other industrial waste constituents. Similar to storm drainage wells but usually higher concentrations.	5D4
<b>Special Drainage Wells</b> — used for disposing water from sources other than direct precipitation. Four types were reported: landslide control drainage wells, potable water tank overflow drainage wells (Idaho), swimming pool drainage wells (Florida) and lake level control drainage wells	Moderate-Low	Chlorinated and treated water, pH imbalance, algacides, fungicides, muriatic acid.	5G30
<b>GEOHERMAL REINJECTION WELLS</b>			
<b>Electric Power Reinjection Wells</b> — reinject geothermal fluids used to generate electric power — deep wells.	Moderate	pH imbalance, minerals and metals in solution. (As, Bo, Se), sulfates.	5A5
<b>Direct Heat Reinjection Wells</b> — reinject geothermal fluids used to provide heat for large buildings or developments — deep wells.	Moderate	Hot geothermal brines with TDS between 2,000 to 325,000 mg/l. Co., CaSO <sub>4</sub> , Sr and Ba, As.	5A6
<b>Heat Pump/Air Conditioning Return Flow Wells</b> — reinject groundwater used to heat or cool a building in a heat pump system — shallow wells.	Low	Potable water with temperatures ranging from 90° to 110° F., may have scale or corrosion inhibitors.	5A7
<b>Groundwater Aquaculture Return Flow Wells</b> — reinject groundwater or geothermal fluids used to support aquaculture. Non-geothermal aquaculture disposal wells are also included in this category	Moderate	Used geothermal waters which may be highly mineralized & include traces of arsenic, boron, fluoride, dissolved & suspended solids, animal detritus, perished animals and bacteria.	5A8
<b>DOMESTIC WASTEWATER DISPOSAL WELLS</b>			
<b>Untreated Sewage Waste Disposal Wells</b> — receive raw sewage wastes from pumping trucks or other vehicles which collect such wastes from single or multiple sources. (No treatment)	High	Soluble organic & inorganic compounds including household chemicals. Raw sewage with 99.9% water and .03% suspended solid. May contain pathogenic bacteria & viruses, nitrates, ammonia.	5W9
<b>Cesspools</b> — including multiple dwelling, community, or regional cesspools, or other devices that receive wastes and which must have an open bottom and sometimes have perforated sides. Must serve greater than 20 persons per day if receiving solely sanitary wastes. (Settling of solids)	High	Soluble organic & inorganic compounds including household chemicals. Raw sewage with 99.9% water and .03% suspended solid. May contain pathogenic bacteria & viruses, nitrates, ammonia.	5W10
<b>Septic Systems (Undifferentiated Disposal Method)</b> — used to inject the waste or effluent from a multiple dwelling, business establishment, community, or regional business establishment septic tank. Must serve greater than 20 persons per day if receiving solely sanitary wastes. (Primary Treatment)	High-Low	Varies with type of system: fluids typically 99.9% water (by weight) and .03% suspended solids: major constituents include nitrates, chlorides, sulfates, sodium, calcium, and fecal coliform.	5W11
<b>Septic Systems (Well Disposal Method)</b> — examples of wells include actual wells, seepage pits, cavitettes, etc. The largest surface dimension is less than or equal to the depth dimension. Must serve greater than 20 persons per day if receiving solely sanitary wastes. (Less treatment per square area than 5W32)	High-Low	Varies with type of system: fluids typically 99.9% water (by weight) and .03% suspended solids: major constituents include nitrates, chlorides, sulfates, sodium, calcium, and fecal coliform.	5W31
<b>Septic Systems (Drainfield Disposal Method)</b> — examples of drainfields include drain or tile lines, and trenches. Must serve more than 20 persons per day if receiving solely sanitary wastes. (More treatment per square area than 5W31)	High-Low	Varies with type of system: fluids typically 99.9% water (by weight) and .03% suspended solids: major constituents include nitrates, chlorides, sulfates, sodium, calcium, and fecal coliform.	5W32
<b>Domestic Wastewater Treatment Plant Effluent Disposal Wells</b> — dispose of treated sewage or domestic effluent from small package plants up to large municipal treatment plants. (Secondary or further treatment)	High-Low	Lower levels of organics and bacteria than other septic systems and cesspools.	5W12
<b>MINERAL AND FOSSIL RECOVERY RELATED WELLS</b>			
<b>Mining, Sand, or Other Backfill Wells</b> — used to inject a mixture of water and sand, mill tailings, and other solids into mined out portions of subsurface mines whether what is injected is a radioactive waste or not. Also includes special wells used to control mine fires and acid mine drainage wells.	Moderate	Acidic waters	5X13
<b>Solution Mining Wells</b> — used for in-situ solution mining in conventional mines, such as stopes leaching.	Moderate-Low	2.4% sulfuric acid, pH less than 2 for copper & ferric cyanide solution for gold or silver.	5X14
<b>In-situ Fossil Fuel Recovery Wells</b> — used for in-situ recovery of coal, lignite, oil shale, and tar sands.	Moderate	Steam, air, solvents, igniting agents.	5X15
<b>Spent-Brine Return Flow Wells</b> — used to reinject spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts.	Low	Variable	5X16

Table 2 (continued)

Name of Well Type and Description	Ground Water Contamination Potential	Potential Contaminants	EPA Well Code
<b>INDUSTRIAL/COMMERCIAL/UTILITY DISPOSAL WELLS</b> <b>Cooling Water Return Flow Wells</b> — used to inject water which was used in a cooling process, both open and closed loop processes	Low-Moderate	Anti-sealing additives, thermal pollution, potential for industrial spills reaching ground water.	5A19
<b>Industrial Process Water and Water Disposal Wells</b> — used to dispose of a wide variety of wastes and wastewaters from industrial, commercial, or utility processes. Industries include refineries, chemical plants, smelters, pharmaceutical plants, laundromats and dry cleaners, tanneries, carwashes, laboratories, etc. Industry and waste stream must be specified (e.g. Petroleum Storage Facility — storage tank condensation water; Electric Power Generation Plant — mixed waste stream of laboratory drainage, fireside water, and boiler blowdown; Car Wash—Mixed waste stream of detergent, oil and grease, and paved area washdown; Electroplating Industry—spent solvent wastes; etc).	High	Potentially any fluid disposed by various industries, suspended solids, alkalinity, sulfate volatile organic compounds.	5W20
<b>Automobile Service stations Disposal Well</b> — repair bay drains connected to a disposal well. Suspected of disposal of dangerous or toxic wastes.	High	Heavy metals, solvents, cleaners, used oil and fluids, detergents, organic compounds.	5X 28
<b>RECHARGE WELLS</b> <b>Aquifer Recharge Wells</b> — used to recharge depleted aquifers and may inject fluids from a variety of sources such as lakes, streams, domestic wastewater treatment plants, other aquifers, etc .	High-Low	Variable: water is generally of good quality	5R21
<b>Saline Water Intrusion Barrier Wells</b> — used to inject water into fresh water aquifers to prevent intrusion of salt water into fresh water aquifers.	Low	Varies: advanced treated sewage, surface urban and agricultural runoff, and imported surface waters.	5B22
<b>Subsidence Control Wells</b> — used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with over-draft of fresh water and not used for the purpose of oil or natural gas production.	Low	No specific type of injected fluid noted, similar to aquifer recharge wells.	5S23
<b>MISCELLANEOUS WELLS</b> <b>Radioactive Waste Disposal Wells</b> — all radioactive waste disposal wells other than Class IV wells.	Unknown	Low-level radioactive wastes.	5N24
<b>Experimental Technology Wells</b> — wells used in experimental or un-proven technologies such as pilot scale in-situ solution mining wells in previously unmined areas.	Low-Moderate	Varies depending on project.	5X25
<b>Aquifer Remediation Related Wells</b> — wells used to prevent, control, or remediate aquifer pollution, including but not limited to Superfund sites.	Unknown	Nutrients used in Biodegradation of organics, oil/grease, phenols, toluene.	5X26
<b>Abandoned Drinking Water Wells</b> — used for disposal of waste.	Moderate	Potentially any kind of fluid, particularly brackish or saline water, hazardous chemicals and sewage.	5X29
<b>Other Wells</b> — any other unspecified Class V wells: Well type/purpose and injected fluids must be specified.	Unknown	Variable	5X27